EMERGENCY RESPONSE PLANNING

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1 Introduction

Companies are required to take reasonable measures to prevent emergency situations such as fires or leaks from happening, but emergencies are still possible on any site. Every site should therefore have an emergency plan and the necessary resources in place: designated spaces, equipment and people organised to manage the potential emergencies to reduce harm to employees, the public and the environment or damage to facilities.

This publication describes the key elements of a robust emergency management system to formally assure preparedness using an emergency plan.

2 Scope and purpose

2.1 Scope

This publication is intended to identify key elements and good practices for an emergency management system for EIGA member company operating sites. There may be additional and / or specific requirements for sites falling under SEVESO legislation, for more information see EIGA Doc 60, *Seveso Documents – Guidance on Applicability, Assessment and Legal Documents for Demonstrating Compliance of Industrial Gases Facilities with Seveso Directive(s)* [1].

This publication is intended to address on-site emergencies (possibly with offsite effects).

The emergency management system described in this publication is not intended to meet emergency response of other offsite locations or situations such as:

- pipelines;
- road / transport emergencies;
- events involving member company employees performing work on customer sites;
- events at construction sites;
- crisis management, see EIGA Doc 923, *Guidelines for Crisis Management* [2];
- product recall (such as medical or quality recalls), see EIGA Doc 923 [2]; and
- high or complex buildings.

Actions to be taken under any offsite emergency plan are excluded from this publication.

NOTE The actions expected of drivers delivering or collecting industrial gas products out of hours should be assessed and controlled as part of driver site access authorisation process. It is therefore excluded from most site emergency plans and considered outside the scope of this EIGA publication.

2.2 Purpose

This publication:

- is intended to give guidance on relevant scenarios and appropriate emergency management in the industrial and medical gases industry;
- provides a general outline of the key elements of a robust emergency management system, it is intended to provide guidance to member companies developing their own emergency response systems and to provide elements for consideration when reviewing more established

emergency management systems to develop and improve these systems and site emergency plans; and

- describes the elements that EIGA would expect to see included in an emergency management system and a site emergency plan.

3 Definitions

For the purposes of this publication the following definitions apply.

3.1 Publications terminology

3.1.1 Shall

Indicates that the procedure is mandatory. It is used wherever the criterion for conformance to specific recommendations allows no deviation.

3.1.2 Should

Indicates that a procedure is recommended.

3.1.3 May

Indicate that the procedure is optional.

3.1.4 Will

Is used only to indicate the future, not a degree of requirement.

3.1.5 Can

Indicates a possibility or ability.

3.2 Technical definitions

3.2.1 Contractors, visitors

In this publication the terms contractor, visitor, are intended to cover all types of persons other than site employees, who may be on-site irrespective of their work status or contractual arrangements. Delivery drivers, authority inspectors or third-party companies, are examples.

3.2.2 Emergency

An unplanned event that has or could have serious adverse effects to the health or safety of employees, the community or the environment, and / or could result in damage to or loss of assets and requires timely action.

3.2.3 Emergency plan

Documented measures to be taken inside the site, sometimes referred to as the onsite, site or internal emergency plan.

3.2.4 Emergency response team

Selected persons, usually employees, who are specifically trained and authorised to undertake actions to minimise or mitigate an emergency as identified in the site emergency plan. For more information on individual and other roles see 5.2.

3.2.5 External emergency services

Services provided by the fire and emergency services, police or security service, or other third parties such as the customer or chemical park management.

3.2.6 Offsite emergency plan

Measures to be taken by other persons or designated authorities outside the site. May be initiated by the site emergency plan.

3.2.7 Scenario

A series or development of events, leading from an initiating event, which can be internal or external to the site, that results in an emergency.

3.2.8 Shelter-in-place

A means of taking refuge indoors, usually in a designated room or enclosed area.

3.2.9 Site manager

The person who has overall duty and authority to ensure that the company emergency response system is implemented and effective at the site.

4 Emergency response management system requirements

4.1 Company emergency management system

A company emergency management system should document the requirements and guidelines for writing good emergency plans.

The management system should explain why and where the company has emergency plans in place to prepare for and respond to potential emergency situations.

The requirements for an emergency plan can be specified by legislative or regulatory requirements, company policies and / or risk-based assessments.

The emergency plan will usually depend on the type of site, installation and activities carried out. For example, different types of emergency plans can be required for offices or very small sites compared with the requirements for production sites.

The company management system should specify the responsibilities for writing emergency plans. It should also identify who should be engaged and consulted in the development of emergency plans. This should include:

- the site manager who owns the emergency plan;
- members of the emergency response team;
- those who are responsible for defining and delivering training; and
- those who measure effectiveness of training, exercises and the plan.

The company emergency management system shall make it clear who is responsible for assessing the competence and authorising the members of the intervention or response teams at each site.

The emergency management system should detail the scenarios to be considered when developing emergency plans.

5 Site emergency response plan

The information should be in manageable format that is easy to use in an emergency.

5.1 Elements to be considered when writing emergency plans

The following data and information should be included in a written site emergency plan:

- contact information of parties to be notified or engaged in case of an emergency, such as:
    - external emergency services, for example:
        - fire and rescue services;
        - ambulance;
        - police;
        - poison centre; and
        - hospitals.
    - company representatives (names and / or positions) responsible for providing support in dealing with emergency situations (these can be local or remote) and senior management who need to be aware of the situation;
    - authorities;
    - utility providers;
    - neighbouring sites; and
    - contracting companies identified to provide post-emergency services, for example for environmental clean-up, pipeline repair or provision of temporary utilities.

  NOTE It is recommended that this information is located in the front of the emergency plan.

- description of the organisation and the different roles and responsibilities for dealing with emergencies (may include remote support from the company organisation to the facility), consider illustrating this in an organogram;
- description of assembly point, one or more assembly points shall be defined inside / outside the plant where all the employees, contractors and visitors shall evacuate to. The location of the assembly point(s) should be based on the potential emergency hazards, prevailing weather and traffic conditions;

  NOTE It is good practice to include an outline explanation of why these locations were selected.

- description of the alarm, evacuation and shelter-in-place (if applicable) procedures.

  NOTE If there are alternate assembly points, the communication should clearly define which location is to be used and how the location could be changed if an incident escalates.

- description of the actions which should be taken to control the reasonably foreseeable conditions or events and to limit their consequences, the following emergency scenarios may be considered:
    - fire (if relevant, a distinction can be made between classical fires and fires involving hazardous substances, or electrical fires);

- explosion;
- release of substances that could create a hazardous situation for people or the environment (releases that require similar response actions may be grouped together, it is not necessary to document a separate scenario per substance);
- medical emergencies (injured or unwell people requiring urgent medical attention), including whether someone should accompany or meet injured or unwell person at hospital;
- health pandemic (for example avian influenza or coronavirus);
- cyber-attack (computer virus);
- natural causes such as severe weather conditions, floods and earthquakes;
- terror acts, threats (including bomb threats, anthrax);
- political unrest, blockades or strikes;
- loss of utilities (electricity, natural gas, communication, drinking water, fire water, cooling water, steam, sewers); and
- nearby offsite incidents with potential impact to the facility (based on information available to member company for example by Seveso conversations) such as:
  - fire or explosion on neighbouring facility;
  - toxic release from neighbouring facility;
  - transport incident with fire or release of hazardous substance; and
  - pipeline incidents.

NOTE For determining and describing the required emergency response actions, all facility manning levels should be taken into consideration, for example office hours / non-office hours, weekends, early or late shifts.

- description of available emergency equipment and resources;

  NOTE It is considered good practice to indicate the locations of emergency equipment on a facility plot plan such as fire extinguishers, windsocks, automatic fire detection and firefighting systems, eye wash stations, safety showers, first aid equipment, spill clean-up kits.

- arrangements for training employees in the duties they will be expected to perform during emergencies;
- arrangements for exercises with offsite emergency services, as appropriate;

  NOTE For Seveso sites, periodical exercises with the public emergency services may be required by the local regulation.

- arrangements for reporting to regulatory authorities according to national legislation;
- if part of an offsite emergency plan, arrangements for providing early warning of the incident to the authority responsible for setting the offsite emergency plan in motion, the type of information which should be contained in an initial warning and the arrangements for the provision of more detailed information as it becomes available (this is mandatory for Seveso sites);

- plot plans or drawings indicating the location of elements that can be important in case of an emergency, such as:
    - storage locations of hazardous substances;
    - process equipment containing hazardous substances;
    - main isolation points of utilities (natural gas, electricity, water, fuel, pipelines, etc.) and plant or area emergency trip stations;
    - sewer system (drain, isolation and access points);
    - emergency equipment;
    - evacuation routes and assembly / muster points;
    - office / building layouts; and
    - fire protection plans, drawings showing detector locations, etc.
- forms or other documents to be used in emergency situations for example:
    - register of onsite personnel (including long-term contractors);
    - script for response to telephone threats;
    - reporting or notification forms;
    - other checklists designed to help emergency controller; and
    - emergency contact details (phone numbers etc.). and
- maps of surrounding areas showing access routes, neighbouring facilities, hospitals, prevailing wind directions.

5.2 Define roles and responsibilities

5.2.1 Emergency response team

The emergency response team (if any) is a group of employees of the company who are trained for specific tasks for various emergency scenarios (for example the use of breathing apparatus, fire extinguishers, first aid, etc) and can mobilise immediately.

It is important to ensure that roles required for appropriate emergency response are provided at all times when the site is occupied (for example office hours / non-office hours, early or late shifts).

Functions of an emergency team response team can include:

- emergency controller;
- evacuation coordinator;
- fire marshal;
- intervention team / leader manager;
- internal firefighter;
- first aider; and

- traffic management (to direct emergency services to scene).

5.2.2 First aider

First aiders should provide support to ill or injured persons in a safe location (including assembly point). First aiders may only return to evacuated areas under the instruction of the emergency controller.

5.2.3 Internal firefighters

Employees who are designated firefighters shall be trained, authorised and practised in the use of each type of equipment according to the site emergency plan. Internal firefighters shall be clearly instructed about what they are not allowed to undertake.

5.2.4 Emergency controller

The emergency controller is responsible for the overall management of site safety during emergency including directing the actions of the intervention team members.

The responsibilities of the emergency controller include:

- understand what has happened;
- confirm that emergency services have been called;
- understand which processes, equipment or operations are still running, consider instructing the intervention team to switch some process operations off;
- understand if any persons are missing, based on reports from the evacuation coordinator and others;
- decide if any action is required and can be performed safely by the site intervention team and be informed of their progress / success, for example:
    - move vehicles away from affected areas and / or to improve emergency vehicle access; and
    - move cylinder pallets / packs away from fires.
- ensure that first aid is provided to injured persons until the emergency services arrive;
- meet, brief and coordinate with emergency services;
- be ready to advise of the health consequences and impact of release of products (for example flammable or toxic gases, cryogenic liquids);
- initiate any offsite emergency plan, if / when appropriate;
- control access to site;
- ensure the communication of basic information about the emergency within the company in accordance with incident reporting and / or crisis management procedures;
- ensure that authorities are notified as legally required;
- follow company guidelines on information provided to the media and by whom;
- inform pipeline customers of potential interruption to supply;

- where possible preserve the scene, to assist future investigation;
- arrange for collection of information such as video camera footage;
- decide and communicate the all-clear; and
- plan and manage restart after emergency.

5.2.5 Evacuation coordinator

The evacuation coordinator is responsible to determine by accounting which employees, visitors and contractors have gathered at the defined assembly location(s), in order to identify missing persons.

The names of missing persons and ideally last known locations should be communicated clearly and immediately to the emergency controller and/or emergency services as defined in the emergency plan.

The evacuation coordinator is then responsible to keep the assembled people informed of the understanding of the emergency situation as it progresses.

The evacuation coordinator is also responsible for the wellbeing and safety of persons at the assembly point until the emergency is finished, or until the emergency controller in discussion with emergency services determine that those people should leave the site or be sent home.

5.2.6 Fire marshal

In larger offices persons may be designated who are responsible to confirm that no personnel are left in offices, toilets, meeting rooms, etc. while those fire marshals evacuate themselves. Fire marshals are not trained in rescue and normally report confirmation of cleared areas to the evacuation coordinator.

5.2.7 The Intervention team leader

The intervention team leader shall carry out the supervision of tasks identified by (or with) the emergency controller as necessary and safe in order to minimise avoidable personal injuries and material damage as far as possible.

The intervention team leader should work with the emergency controller to:

- compose a team based on people available;
- perform interventions based on actions documented in the emergency plan;
- discuss with selected team how intervention will be attempted;
- agree how team will communicate and coordinate during the intervention;
- regularly update the emergency controller on progress, status and success of intervention; and
- cooperate with emergency services if applicable to ensure smooth cooperation.

5.3 Define resources, equipment

A competent, well organised emergency team with clear responsibilities assigned should have equipment, procedures and checklists for most common emergency scenarios.

Check the requirement for the following types of emergency equipment and maintain as required:

- firefighting equipment including supplied air breathing apparatus;

first aid equipment (for example first aid kit, eye wash, safety showers, Automatic External Defibrillators, medical oxygen for first aid) shall be available in suitable cabinets. These cabinets shall be equipped and positioned according to the site hazards and local regulations;

NOTE There shall be a person authorised to regularly check equipment and first aid kits and replace missing items or remove the items that have expired.

- rescue equipment, such as stretchers, cutting equipment, harnesses and retrieval systems;
- remote controls to shut down, isolate plant or operate safety equipment such as fire water or monitors; and
- Equipment to ensure communication to employees and recue services such as site alarms, sirens, telephone, megaphones, public address system (loudspeakers), two-way radios.

Equipment for escape should be considered and kept ready for use including:

- Emergency escape breathing apparatus (EEBA), rebreathers, filter masks;
- designated shelter in place, (refuge in the event of toxic release, fire / explosion); and
- windsocks.

Different types of gas detection and alarms such as oxygen monitoring, flammable gas detectors or detectors for toxic gases may be required.

Access for emergency vehicles and personnel escape routes shall be clearly defined / marked and kept free at all times.

The following site information should be available, for example:

- fire plan (including storage areas and amounts);
- machinery plan;
- water hydrants plans;
- permits;
- safety report; and
- contracts.

These documents shall be kept in safe places so that they do not fail in an emergency (for example fire) or are damaged / destroyed.

The emergency plan should include an inventory list of all emergency equipment and a site plan indicating the location of this equipment. Copies of this and other plans should be kept in locations accessible during the emergency, including cloud storage solutions.

5.4 Evacuation plans (when, how far, duration)

A disorganised evacuation can result in confusion, injury, and property damage. When developing an evacuation plan, it is important to determine the following:

- Conditions under which an evacuation would be necessary.

  A wide variety of emergencies both man-made and natural, may require a workplace or the whole site to be evacuated. These emergencies include, for example, fires, explosions, floods,

earthquakes, storms, toxic or asphyxiant releases, radiological and biological accidents, civil disturbances and workplace violence.

The plan shall identify when and how employees are to respond to different types / severity of emergencies. For example, shelter-in-place if threatened by a chemical spill or gas release, or evacuate to an exterior location during a fire. The type of building may be a factor in the decision.

- Conditions under which it may be better to shelter-in-place.

  A release into the environment in such quantity onsite or in proximity to the site that it is safer to remain indoors rather than to evacuate employees. Examples of situations that may result in a decision to institute shelter-in-place include an explosion in an ammonia refrigeration system, a large release of cryogenic gas, or a derailed and leaking tank car transferring a toxic material.

  A shelter-in-place signal should be easily distinguishable from that used to signal an evacuation. Employees should be trained in the shelter-in-place procedures and their roles in implementing them.

  For more information see EIGA Doc 187, *Guideline for the Location of Occupied Buildings in Industrial Gas Plants* [3].

- Who is authorised to order an evacuation or shutdown, as defined in 5.2.

  When emergency officials, such as the local fire department, respond to and emergency at the facility they will assume responsibility for the safety of occupants and have the authority to make decisions regarding evacuation and whatever other actions are necessary to protect life and property. The highest-ranking emergency official will assume the incident command role and will work with the onsite emergency controller.

- Routes, exits and safe assembly points.

  Maps and drawings from floor diagrams with arrows that indicate the exit routes should be prepared. These maps / drawings should include locations of exits, assembly points, and equipment (such as fire extinguishers, first aid kits, and spill kits) that may be needed in an emergency (see ISO 23601, *Safety identification — Escape and evacuation plan signs* and local regulation) [4].

  Drawings that show evacuation routes and exits, should be posted prominently for all employees to see. Exit routes should be:

  - clearly marked and well lit;
  - wide enough to accommodate the number of evacuating personnel;
  - unobstructed and clear of debris at all times;
  - unlikely to expose evacuating personnel to additional hazards; and
  - permanent part of the workplace and be separated by fire resistant materials of suitable fire resistance rating.

- Procedures for assisting visitors and employees to evacuate, including those with disabilities or who do not speak the local language.

- Designation of what operations employees may perform, prior to evacuation, if safe and practical, for example, complete room sweeps, collect first aid kits, isolate specified energy sources.

- How the building or site is evacuated and ensure no one remains unaccounted for, including employees, contractors and visitors. This can include in / out boards, head counts, floor sweeps, partitioning in smaller teams (for example per workstation / department), etc.

5.5 Closing emergency, return to normal business

When emergency officials, such as the local fire department, respond to an emergency at the facility, they decide when the site is considered safe to re-enter the building or site.

Before re-starting equipment, plant or production processes, they shall be assessed by authorised personnel to ensure they are safe and ready to operate.

NOTE All work permits should be cancelled by an emergency and re-issued before any work re-starts.

Appropriate business continuity plans should address the product and services continuity in the period of downtime.

6 Training and exercises

To prepare for any emergency it is necessary that all employees, contractors and visitors, who may be present on site, are made aware of the potential consequences of hazardous activities and have the information and training appropriate for their roles in the emergency.

6.1 Person initiating site evacuation

The site emergency plan should clearly define whether anyone can initiate a site evacuation, or whether this decision is restricted to specified employees. This should be mentioned in site induction and employee training.

6.2 Employee general training

Training of all onsite employees should include:

- overview of the site (internal) emergency plan;
- emergency scenarios and the importance of prevention;
- how to activate the alarm(s);
- when, how and where to evacuate (for example in event of fire);
- actions to be taken in response to specific site alarms (for example toxic gas release);
- use of any equipment necessary for protection or escape (for example respiratory mask, emergency shower); and
- specific roles and responsibilities of the emergency response team.

It is good practice that general emergency response training includes some written test / evaluations (for more information see EIGA Doc 23, *Safety Training of Employees*) [5].

NOTE It is common that many employees receive practical and theoretical training in use of portable fire extinguishers. This alone does not qualify people as internal firefighters.

6.3 Emergency response team training

In addition to the general training elements described above, the emergency response team members should receive information, instruction and training specific to their roles. The training should focus on

possible emergency scenarios, including initiating events and the response actions described in the on-site emergency plan including limiting (mitigating) their consequences for people and the environment.

Training should include safe shutdown of processes and utilities in the event of foreseen emergency situations.

For some physical intervention roles, medical fitness shall be defined and tested prior to training. Examples include roles which perform rescue / recovery or who wear breathing apparatus.

For some intervention roles in addition to training, individuals shall demonstrate their competence before becoming authorised team members.

6.3.1 First aiders

First aiders shall be trained and qualified in accordance with national legislation.

6.3.2 Internal firefighters

If the site-specific emergency plan requires use of any other firefighting equipment beyond portable fire extinguisher, then designated employees shall receive specific training on safe use of each type of equipment, including hazards, and limitations.

It is essential that the expected actions and restrictions of employees undertaking these actions is clearly documented, trained, practised and risk assessed.

6.4 Practical scenario exercises, what-if, tabletop exercises

Practical drills and theoretical exercises such as tabletop and what-if exercises should be performed to address different foreseeable scenarios from the emergency plan. Practices should be organised so that scenarios are tested within a reasonable timeframe. Practical exercises may include external agencies such as local fire brigades.

6.5 Evacuation exercises

There should be periodic practical evacuation exercises / drills for all employees including contractors and visitors. The exercises should be recorded, evaluated and any lessons learned documented (see 7.2).

6.6 Information for contractors, visitors

Relevant parts of the site emergency plan, as well as the hazards present in the plant, shall be shared with contractors and visitors by means such as induction programmes, visitor information flyers or the work permit process. Where training is given to visitors or contractors it should be recorded. Competence assessment may be required.

7 Periodic review

To ensure that the emergency response system is efficient and effective, a periodic review should be set up. The periodic review verifies if the emergency response system is operational according the written documentation.

7.1 Testing and inspection

The company shall determine what is inspected and tested. Examples include the correct functioning of:

- detection systems (for example smoke / fire, gas monitoring, alarm setting);
- warning systems (for example sounders / sirens and visual indication / lamps);

- emergency systems, for example emergency lighting, emergency exits, ventilation systems and automatic extinguishing systems; and

- emergency phones numbers and ensure they are up to date and are answered 24/7.

NOTE If a site has an internal emergency number or a man-down system, access and availability shall be ensured during evacuation.

The method, responsibility, frequency and time of day / week for testing and inspection should be determined depending on the importance and the likelihood of changes (for example telephone numbers or new installations).

The site manager shall evaluate the test and inspection results and use them as input for the review of the site emergency response plan.

7.2 Auditing

The company should ensure that audits of the emergency management system are conducted at planned intervals. The auditor verifies if the system has been set up according the company requirements and verifies if they are effectively implemented. For further information on auditing see EIGA Doc 102, *Auditing Guidelines* [6].

7.3 Company emergency management system review

It is good practice to review and, if required, update the company emergency management system periodically. The review should ensure that the system is adapted to changing circumstances and includes lessons learned.

8 References

Unless otherwise specified, the latest edition shall apply.

[1] EIGA Doc 60, *Seveso Documents - Guidance on Applicability, Assessment and Legal Documents for Demonstrating Compliance of Industrial Gases Facilities with Seveso Directive(s)*, www.eiga.eu.

[2] EIGA Doc 923, *Guidelines for Crisis Management*, www.eiga.eu.

[3] EIGA Doc 187, *Guideline for the Location of Occupied Buildings in Industrial Gas Plants*, www.eiga.eu.

[4] ISO 23601, *Safety identification — Escape and evacuation plan signs*, www.iso.org.

[5] EIGA Doc 23, *Safety Training of Employees*, www.eiga.eu.

[6] EIGA Doc 102, *Auditing Guidelines*, www.eiga.eu.

9 Other References

EIGA Info HF 06, *Organisation - "Site Emergency Response"*, www.eiga.eu.

There is additional information on specific emergency response provisions and requirements for different processes and substances in EIGA publications found on the EIGA website www.eiga.eu.